I Claim:

1. A DC voltage chopper, comprising:

a power switch device having a drive circuit and a main circuit connected to and driven by said drive circuit;

an LC filter circuit connected to said main circuit, said LC filter circuit having an output terminal functioning as an output terminal of the DC voltage chopper;

a commutating circuit connected in parallel to said LC filter circuit;

a reference voltage generator outputting a reference voltage; and

a comparison circuit having a hysteretic function and an output coupled to said drive circuit, said comparison circuit having a first input terminal connected to said output terminal of the DC voltage chopper and a second input terminal connected to said reference voltage generator and receiving the reference voltage;

said drive circuit containing a logic circuit having a first input connected to said output of said comparison circuit for receiving a switch-off signal for said power switch device and

a second input for receiving a switch-on signal for said power switch device, said second input receiving a trigger clock signal with a fixed frequency as the switch-on signal, said logic circuit generating an output signal for switching said power switch device on after a constant period of time being determined by the fixed frequency of the trigger clock signal, said logic circuit switching said power switch device off as soon as an output voltage of the DC voltage chopper reaches the reference voltage.

2. The DC voltage chopper according to claim 1, further comprising a current detecting circuit for detecting a maximum current intensity flowing through said power switch device and connected to said main circuit, said logic circuit having an OR gate for OR-linking switch-off signals derived from the output voltage and from the maximum current intensity detected.

3. The DC voltage chopper according to claim 1, further comprising a ramp circuit connected to said reference voltage generator and generating a ramp signal, said ramp circuit varying the reference voltage supplied to said second input terminal of said comparison circuit periodically with the ramp signal.

4. The DC voltage chopper according to claim 3, wherein said ramp circuit receives the trigger clock signal, and the ramp signal is triggered by the trigger clock signal.

5. The DC voltage chopper according to claim 3, wherein the ramp signal is a sloping ramp signal.

6. The DC voltage chopper according to claim 5, wherein the ramp signal has a ramp sloping linearly.

7. The DC voltage chopper according to claim 5, wherein the ramp signal slopes non-linearly.

8. The DC voltage chopper according to claim 3, wherein the ramp signal has a quadratically sloping ramp.

9. The DC voltage chopper according to claim 2, further comprising:

an overvoltage protection circuit for detecting an excess output voltage at said output terminal of the DC voltage chopper, said overvoltage protection circuit containing a further comparison circuit exhibiting hysteretic behavior and having a first input terminal connected to said output terminal, and a second input terminal receiving an overvoltage reference signal, said further comparison circuit outputting

an output signal supplied to said OR gate of said logic circuit as an additional switch-off signal where it is OR-linked with the switch-off signal derived from the maximum current intensity detected.

10. The DC voltage chopper according to claim 9, wherein the overvoltage reference signal is offset from the reference DC voltage by an offset voltage.

11. The DC voltage chopper according to claim 9, wherein the DC voltage chopper performs hysteretic regulation only in a discontinuous current mode, and works as a current mode regulator in a continuous current mode.

12. The DC voltage chopper according to claim 1, wherein said logic circuit blocks a switch-on operation when said comparison circuit detects a signal that is larger than a switch-on threshold at said output terminal of the DC voltage chopper.

13. The DC voltage chopper according to claim 1, wherein said logic circuit has a timing element for leaving said power switch device on for a short time regardless of whether said logic circuit has received the switch-off signal.

14. The DC voltage chopper according to claim 3, wherein the ramp signal forms a progressively sloping ramp.

15. The DC voltage chopper according to claim 2, further comprising:

an error amplifier circuit for analyzing the output voltage, said error amplifier having a first input connected to said reference voltage generator and receiving the reference voltage, a second input connected to said output terminal, and a circuit output outputting an error amplifier signal; and

a further comparison circuit exhibiting hysteretic behavior and having a first input terminal connected to said circuit output and receiving the error amplifier signal, and a second input terminal receiving an further reference voltage, said further comparison circuit outputting an output signal supplied to said OR gate of said logic circuit as an additional switch-off signal.

16. The DC voltage chopper according to claim 15, wherein the error amplifier signal is offset from the further reference signal by an offset voltage.

17. The DC voltage chopper according to claim 15, wherein the DC voltage chopper performs hysteretic regulation only in a

discontinuous current mode, and works as a current mode regulator in a continuous current mode.

18. A DC voltage chopper, comprising:

a power switch device having a drive circuit and a main circuit connected to and driven by said drive circuit;

an LC filter circuit connected to said main circuit, said LC filter circuit having an output terminal functioning as an output terminal of the DC voltage chopper;

a commutating circuit connected in parallel to said LC filter circuit;

a reference voltage generator outputting a reference voltage;

a comparison circuit having a hysteretic function and an output connected to said drive circuit, said comparison circuit having a first input terminal connected to said output terminal, and a second input terminal connected to said reference voltage generator and receiving the reference voltage; and

a current detecting circuit for detecting a maximum current intensity flowing through said power switch device and connected to said main circuit;

said drive circuit having a logic circuit with a first input connected to said output of said comparison circuit for receiving a switch-off signal for said power switch device, and a second input for receiving a switch-on signal for said power switch device, said second input receiving a trigger clock signal with a fixed frequency as the switch-on signal, said logic circuit generating an output signal for switching said power switch device on always after a constant period of time determined by the fixed frequency of the trigger clock signal, said logic circuit switching said power switch device off as soon as the output voltage of the DC voltage chopper reaches the reference voltage;

said logic circuit having an OR gate for OR-linking switch-off signals derived from the output voltage and from the maximum current intensity detected.